Category	Action	Description / Relevance	Status	Link	Notes
Initial Investigation	Point Discharge Nutrient and UBOD monitoring	Point Discharger monitoring of nutrient parameters including: Facilites < 1 MGD: *quarterly* for 2 years (28 facilities) Facilites > 1 MGD: *monthly* for 2 years (55 facilities) for: - Phosphorus: Total Phosphorus, Soluble Reactive Phosphorus (SRP) - Nitrogen: Ammonia, NO3, NO2, TKN, SKN - BOD5, CBOD5, BOD20	Completed, November 2016	https://www.nj.gov/drbc/library/documents/WQAC/051117/yagecic_point-source-nut-mon.pdf	Nutrients
			Completed, August 2017	https://www.nj.gov/drbc/library/documents/WQAC/082417/suk_BOD-data-eval.pdf	UBOD
Initial Investigation	Investigation of DO statistical models for Delaware Estuary	DRBC developed and assessed multiple statistical models for predicting DO in the estuary as a function of a wide variety of possible explanatory variables including meteorological, flow, and solar radiation variables. Efforts emphasized that existing possible explanatory variables (not including loadings) were insufficient to explain variability in estuary DO (highlighting the need for a deterministic model). Work demonstrated the importance of temperature and included optimization of lag and reaction times for key process variables which may be beneficial in later work.	Completed Janaury 2015	http://www.nj.gov/drbc/library/documents/PDEsummit2015/Yagecic_DOdata-mining.pdf	
Initial Investigation	Primary Productivity monitoring in Delaware Estuary	In December 2012 the Eutrophication Modeling Expert Panel reviewed existing information with DRBC and recommended among other activities the collection of new primary productivity data in the estuary. The effort described in this report reflects an initial response to the Expert Panel recommendation.	Completed May 2015	http://www.nj.gov/drbc/library/documents/nutrients/nutrients-chlor-a_DelawareBay_UMd2015.pdf	
Initial Investigation	Review of tributary nutrient loadings via SPARROW DSS tool	NCP called for review of tributary nutrient loads via SPARROW model. Review helps to 1.) prioritize future work 2.) assess importance of tributary nutrients relative to point sources for monitoring and for model development.	Completed October 2013	https://www.dropbox.com/sh/s8n2st4pwjwb35o/AACYcBvUEWs2DE1y8Bvlhpira?dl=0	
Use and Endpoint Investigation	Existing Use Determination	DRBC conducted an evaluation of available data for resident and anadromous fishes to directly address the question as to whether, and to what degree, a broader "propagation" use has occurred in Zones 3, 4, and upper Zone 5 of the Delaware Estuary. The individual evaluations were synthesized into a zone-specific assessment of the "propagation" use.	Completed and posted on DRBC web site March 2016	http://www.nj.gov/drbc/library/documents/ExistingUseRpt_zones3-5_sept2015.pdf	
Use and Endpoint Investigation	Effects of low DO and PCBs on early life-stage sturgeon	A lab based assessment of the effects of low DO (alone) and in combination with PCBs on early life-stage Atlantic Sturgeon by the NYU School of Medicine and NOAA Fisheries Service. This work will evaluate the impact of the two major water quality challenges of the Delaware Estuary on Atlantic Sturgeon and will be critical in determining DO values protective of early life stages.	Completed July 2018	e-mail attachment	
Model Development and Support	Addition of salinity to NOAA ports stations at tidal boundaries.	Existing NOAA PORTS stations at Lewes, DE, Cape May, NJ and Chesapeake City, MD (on C&D Canal) will be upgraded to include continuous real-time salinity. Funding via DRBC water supply storage fund. High resolution salinity data at tidal boundaries will allow improved calibration of all hydrodynamic models (1-D, 3-D, and all others).	Operational since April 2017	https://tidesandcurrents.noaa.gov/ports/ports.html?id=8557380&mode=threedaysct	Lewes, DE
				https://tidesandcurrents.noaa.gov/ports/ports.html?id=8536110&mode=threedaysct	Cape May, NJ
				https://tidesandcurrents.noaa.gov/ports/ports.html?id=8573927&mode=threedaysct	C&D Canal, MD
Model Development and Support	Intital AEMR effluent nutrient data review	DRBC required submittal of annual point discharge effluent monitoring reports (AEMR) including nutrients (a nationally rare data set). This initial review provided descriptions of that data set. Results are expected to be useful toward effluent specification in modeling for uncharacterized point discharges and for assessing currently attained levels of treatment.	Completed May 2014	http://www.nj.gov/drbc/library/documents/AEMR_summary_may2014.pdf	
Model Development and Support	Characterization of salt flux at mouth of bay using Ferry Monitoring	University of Delaware will assess data collected from Ferry monitoring since 2013 to assess spatial and temporal trends, evaluation relationship between Ferry salinity data and data at Brandywine shaol, calculate flux based on tidal elevation and/or velocity, validate Ferry data, and move all data to DEOS. Salt flux will allow improved calibration of all hydrodynamic models.	Data available via DEOS. Assessment completed by DRBC		
Model Development and Support	Addition of real-time nitrate to USGS monitors at the Delaware River at Trenton and Chester	DRBC entered into a support agreement with USGS to add continuous real-time measurement of nitrate at the Delaware River at Trenton and continuous real-time measurement of nitrate and DOC at the Delaware River at Chester.	Operational since December 2017	https://waterdata.usgs.gov/nwis/uv?cb_99133=on&format=gif_default&site_no=01463500&period=&begin_date=2019-08-07&end_date=2019-08-14	Trenton
			Operational since May 2018	https://waterdata.usgs.gov/nwis/uv?cb_99133=on&format=gif_default&site_no=01477050&period=&begin_date=2019-08-07&end_date=2019-08-14	Chester
Ancillary	Near real-time water quality dashboard	DRBC developed automated processes for daily retreival and processing of data for representations of estuary water quality conditions including DO. This product helps DRBC and its partners track the condition of the estuary and react quickly to degraded conditions.	Completed Summer 2015	http://drbc.net/Sky/waterq.htm	
Ancillary	Interactive data visualization tool	DRBC developed 2 interactive applications for visualizing the Boat Run data set, DRBC's long term estuary monitoring program. These application helps demonstrate data spatial and temporal structure. The most current is available at the link.	Completed 2014. Updated 2015. New application 2017.	https://johnyagecic.shinyapps.io/Overplots/	
Model Development and Support	Winter Estuary Ammonia Monitoring	DRBC monitored the estuary to determine if ammonia concentrations were higher in winter than during our normal monitoring season.	Completed February 2016.		
Model Development and Support	Comparative Assessment	Comparative assessment of multiple monitoring efforts including DRBC Boat Run, PWD ambient monitoring, EPA Rare Grant monitoring, and DRBC winter estuary ammonia monitoring.	Completed Spring 2016.	e-mail attachment	
DRBC Resolution	Resolution 2017-4	Resolution authorizing studies and directing the Executive Director to initiate DRBC rulemaking to revise the designated aquatic life uses consistent with the results of the identified studies and the objectives and goals of the federal Clean Water Act	Passed September 2017	https://www.nj.gov/drbc/library/documents/Res2017-04_EstuaryExistingUse.pdf	
DRBC Resolution	Resolution for the Minutes	A Resolution for the Minutes authorizing the Executive Director to require additional point discharge monitoring. See page 9 at the link.	Passed September 2017	https://www.nj.gov/drbc/library/documents/9-13-17_minutes.pdf	See page 9
Use and Endpoint Investigation	DO Needs report	A Review of Dissolved Oxygen Requirements for Key Sensitive Species in the Delaware Estuary performed by ANSDU under contract to DRBC	Completed November 2018	https://www.nj.gov/drbc/library/documents/Review_DOreq_KeySensSpecies_DelEstuary_ANStoDRBCnov2018.pdf	
Use and Endpoint Investigation	Engineering Evaluation and cost estimate	DRBC entered into a contract with Kleinfelder to perform an engineering evaluation and planning level cost estimate for achieving reduced ammonia and TN concentrations at the top 12 point discharges to the Delaware Estuary. See progress update at link.	Under development. Completion expected July 2020	https://www.nj.gov/drbc/library/documents/Yagecic_EngineeringEconomicEvalDO_ANSconf2018.pdf	
Use and Endpoint Investigation	Non-DO Nutrient Endpoints report	DRBC contracted with ANSDU to prepare an evaluation of other nutrient endpoints not associated with DO.	Draft submitted to DRBC in August 2019. Review and comment by WQAC through November 2019.		
Model Development and Support	Expanded monitoring in support of model development	Summaries of multiple expanded monitoring programs in support of eutrophication model development.	Ongoing through 2020	https://www.nj.gov/drbc/library/documents/WQAC/032918/panuccio_eutrophication-model-monitoring2018.pdf	
				https://www.nj.gov/drbc/library/documents/MACC/061719/eutrophication-model_monitoring_panuccio.pdf	
Model Development and Support	Hydrodynamic model evaluation	Developing parallel higher and lower resolution EFDC models.	Under development	https://www.nj.gov/drbc/library/documents/WQAC/082417/suk-zheng_model-dev-status.pdf	Recap of July 2017 Model Expert Panel Meeting
Model Development and Support	Eutrophication model development	Development of multi-dimensional estuary eutrophication model to simulate processes linking external nutrient loadings and estuary DO response.		https://www.nj.gov/drbc/library/documents/WQAC/030118/ExpertPanelUpdate.pdf	March 2018 Model Expert Panel Meeting
				https://www.nj.gov/drbc/library/documents/WQAC/032019/ExpertPanel_WQAReport.pdf	March 2019 Model Expert Panel Meeting